## REMARKS

Claims 18 and 26 are amended. No new claims are added. Claims 1-31 are pending for consideration. In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application.

### Specification Objections

The Office objects to Applicant's use of trademarks in its specification. Applicant has amended the relevant paragraph and requests that this objection be withdrawn.

### Drawing Objections

The Office objects to Applicant's drawings because certain reference signs are mentioned in the description but are not shown on the drawings. Applicant has amended the relevant paragraph of the specification to remove all mention of the specified reference signs (i.e., server operating system 22, Internet Information Server 24, platform 26, and application(s) 30). In addition, Applicant has changed the top and left margins of Fig 2. Applicant requests that all drawing objections be withdrawn.

### § 101 Rejections

**Claims 18-21 and 26-31** stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicant disagrees with the rejections and traverses the Office's rejections.

The Patent Office has provided an "Examination Guideline for Computer-Related Inventions" which is particularly instructive in considering the above

claim rejections. In this guideline, the Office discusses non-statutory subject matter as such relates to computer-related inventions. Specifically, the Office describes two types of descriptive material—functional and non-functional.

Functional descriptive material consists of data structures and computer programs which impart functionality when encoded on a computer-readable medium. Such data structures and programs are statutory when embodied on a computer-readable medium.

A "data structure" is defined, in the PTO's guidelines, as a "physical or logical relationship among data elements, designed to support specific data manipulation functions." (See, footnote 27, citing to *The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993)*). Non-functional descriptive material, on the other hand, includes but is not limited to music, literary works and a compilation or mere arrangement of data.

**Claim 18** has been amended and now recites a Web server input string screening tool embodied ***on a computer-readable medium.*** Applicant submits that this claim is allowable and requests the Office to withdraw its § 101 rejection of this claim.

**Claims 19-21** depend from claim 18 and are allowable as depending from an allowable base claim. Applicant requests the Office to withdraw its § 101 rejection of these claims, as well.

As amended, **claim 26** recites a collection of Web server screening patterns embodied on a computer-readable medium comprising:

- a memory; and
- a plurality of attack patterns stored in the memory, the attack patterns ***being useable*** to screen input strings that are intended for

use by a Web server, individual attack patterns being defined in a manner that permits variability among their constituent parts.

The Office argues that the claimed collection of screening patterns is a data structure and non-functional. Applicant respectfully disagrees and traverses the Office's rejection.

In this particular situation, it is perhaps instructive to consider the Federal Circuit case of *In re Lowry*, 32 F.3d 1579 (1994), where the Court addressed the issue of whether a data structure claim met the statutory requirements of §101. The independent claim that was at issue in that case is presented directly below for the convenience of the Office:

> 1. A memory for storing data for access by an application program being executed on a data processing system, comprising:
>
> a data structure stored in said memory, said data structure including information resident in a database used by said application program and including:
>
> a plurality of attribute data objects (ADOs) stored in said memory, each of said attribute data objects containing different information from said database;
>
> a single holder attribute data object for each of said attribute data objects, each of said holder attribute data objects being one of said plurality of attribute data objects, a being-held relationship existing between each attribute data object and its holder attribute data object, and each of said attribute data objects having a being-held relationship with only a single other attribute data object, thereby establishing a hierarchy of said plurality of attribute data objects;
>
> a referent attribute data object for at least one of said attribute data objects, said referent attribute data object being nonhierarchically related to a holder attribute data object for the same at least one of said attribute data objects and also being one of said plurality of attribute data objects, attribute data objects for which there exist only holder attribute data objects being called element data objects, and attribute data objects for which there also exist referent attribute data objects being called relation data objects; and

> an apex data object stored in said memory and having no being-held relationship with any of said attribute data objects, however, at least one of said attribute data objects having a being-held relationship with said apex data object.

In this case, the Federal Circuit noted that Lowry's ADOs do not represent merely underlying data in a database. The Court commented that the ADOs contain both information used by application programs and information regarding their physical interrelationships within a memory.

In the same way as Lowry's claims contained both information used by application programs and information regarding the physical interrelationship of the ADOs within a memory, claim 26 recites subject matter that contains both *information that is useable by software* (i.e. ". . . attack patterns being ***useable*** to screen input strings that are intended for use by a Web server. . . ."), as well as *information regarding the interrelationship of the data elements* within a memory (i.e. ". . . individual attack patterns being defined in a manner that permits variability among their constituent parts."). Thus, as the claim in Lowry, this claim defines functional characteristics of the computer-readable media.

In characterizing Lowry's claim, the Court noted that Lowry did not claim merely the information content of a memory. In the Court's view, although Lowry's data structures did include data resident in a database, the data structures depended only functionally on information content. While the information content affected the exact sequence of bits stored in accordance with Lowry's data structures, the claims, in the Court's opinion, required specific electronic structural elements which imparted a physical organization on the information stored in memory. The physical organization embodied in the claimed subject matter is the

organization that is provided through an attack pattern's definition in a manner that permits variability among its constituent parts. This variability leads to a more flexible and robust attack pattern search by those systems that employ the claimed attack patterns.

As noted by the Court, in Lowry's invention, the stored data existed as a collection of bits having information about relationships between the ADOs. This was deemed by the Court as the essence of electronic structure. Similarly, the claimed subject matter exists as a collection of bits that have information about the interrelationship of an attack pattern's constituent parts.

As the Court further noted, more than mere abstraction, the data structures were specific electrical or magnetic structural elements in a memory. According to Lowry, the data structures provided tangible benefits: data stored in accordance with the claimed data structures were more easily accessed, stored, and erased. The Court further observed that, unlike prior art data structures, Lowry's data structures simultaneously represented complex data accurately and enabled powerful nested operations. As the Court noted, in short, Lowry's data structures were physical entities that provided increased efficiency in computer operation. Hence, the Court found the recited data structure statutory under § 101.

In much the same way, claim 26 recites statutory subject matter that defines specific elements in memory that provide tangible benefits—that of screening input strings that are intended for use by a Web server in a flexible and robust manner. To this end, Applicant's recited data structure is a physical entity that provides increased efficiencies in screening input strings.

Accordingly, Applicant respectfully traverses the Office's rejection and submits that claim 26 is allowable.

**Claims 27-31** are allowable as depending from an allowable base claim.

**35 U.S.C. §§ 102 and 103 Rejections**

Claims 1-11 and 13-30 stand rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 5,884,033 to Duvall et al (hereinafter, "Duvall"). Claims 12 and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Duvall in view of Oliver et al., "Building a Windows NT 4 Internet Server", 1996, p. 203.

**The Duvall Reference**

The reference to **Duvall** discloses a client-based filtering system. The system allows a user to filter material received over the Internet that is personally objectionable, whether that material is sexually explicit, violent, politically extreme, or otherwise, depending on the user's individual tastes and sensitivities.

The filter compares portions of incoming and/or outgoing messages to filtering information in a filter database and determines whether to block or allow incoming and/or outgoing transmissions of messages in response to the comparison. In response to a match between the portion of the message and the filtering information, the system can employ one of a number of different specified blocking options. The system has an update server that is accessible over the Internet and that has new filtering information for updating the filter database.

**Claims 1-6**

**Claim 1** recites a Web server input string screening method comprising [emphasis added]:

- determining an ***attack pattern*** that can be used to ***attack a Web server***;
- defining a search pattern that can be used to detect the ***attack pattern***, the search pattern being defined in a manner that permits variability among its constituent parts;
- receiving an input string that is intended for use by a Web server;
- evaluating the input string using the search pattern to ascertain whether the ***attack pattern*** is present; and
- implementing a remedial action if an ***attack pattern*** is found that matches the search pattern.

In the Office Action, the Office rejects this claim under 35 U.S.C. § 102 and argues that Duvall anticipates the claimed subject matter. Specifically, the Office argues that Duvall "defines a plurality of unwanted input strings to be filtered (see column 3, line 64 to column 4, line 11), a search pattern that permits variability, can search a portion of the string, and has wildcard characters (see column 6, lines 28-42), receives an input string on a web server (see column 8, lines 18-27), evaluates the strings, and takes remedial action if necessary, including denying the request (see column 6, line 60 to column 7, line 13)."

Applicant submits that Duvall does not anticipate this claim and respectfully traverses the rejection. According to MPEP § 706.02, "for anticipation under 35 U.S.C. 102, the reference must teach ***every aspect*** of the claimed invention either explicitly or impliedly. Any feature not directly taught must be ***inherently present***."

The first element of claim 1 recites "determining an ***attack pattern*** that can be used to ***attack a web server***." Duvall does not disclose this; and, in fact, the Office does not even ***cite*** Duvall for this feature. Furthermore, Duvall does not even ***remotely*** suggest determining an ***attack pattern*** that can be used to ***attack a Web server***. Duvall's disclosure actually has absolutely ***nothing*** to do with Web

server attacks. Instead, Duvall's disclosure deals with a system in which a user can filter material received over the Internet that is ***personally objectionable***, whether that material is sexually explicit, violent, politically extreme, or otherwise, depending on that user's ***individual tastes and sensitivities***. This is very different from and not to be confused with determining an ***attack pattern*** that can be used to ***attack a Web server***. Accordingly, for at least these reasons, this claim is allowable.

**Claims 2-6** depend either directly or indirectly from claim 1 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 1, are neither disclosed nor taught by the references of record, either singly or in combination with one another.

**Claims 7-12**

**Claim 7** recites a Web server input string screening method comprising [emphasis added]:

- defining one or more search patterns that comprise literal characters and special characters, wherein the literal characters indicate exact characters in an input string that is intended for receipt by a Web server, and the special characters indicate variable characters in an input string that is intended for receipt by the Web server, the search patterns being usable to search for an ***attack pattern*** that can be used to ***attack the Web server***; and
- storing the one or more search patterns in a memory location that is accessible to a screening tool for evaluating an input string that is intended for receipt by the Web server.

In making out the rejection of this claim, the Office again argues that Duvall anticipates this claim. Once more, Applicant respectfully submits that

Duvall does not anticipate this claim. As noted above, Duvall discloses ***nothing*** of search patterns that are useable to search for an ***attack pattern*** that can be used to ***attack a Web server***. Moreover, Duvall does not even ***suggest*** any sort of method whatsoever for dealing with attack patterns, let alone their use in connection with a Web server. Accordingly, for at least these reasons, this claim is allowable.

**Claims 8-12** depend from claim 7 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 7, are neither disclosed nor taught by the references of record, either singly or in combination with one another.

In addition, with respect to claim 12, which is rejected in view of Oliver, that reference is not seen to add anything of significance given the allowability of this claim and the failure of Duvall to anticipate claim 7.

**Claims 13-17**

**Claim 13** recites a Web server input string screening method comprising [emphasis added]:

- defining one or more search patterns that are specified as a regular expression, the search patterns being usable to search for an ***attack pattern*** that can be used to ***attack the Web server***; and
- storing the one or more search patterns in a memory location that is accessible to a screening tool for evaluating an input string that is intended for receipt by the Web server.

Again, the Office rejects this claim under § 102 by arguing that Duvall discloses that "the search patterns may be stored in RAM." The Office cites to column 4, lines 45-49, which are reproduced below:

> The system then checks for and retrieves any filters that match the particular IP address. The retrieved filters are checked to determine if any require immediate action, i.e., if unconditional allowing or blocking is required (steps 104, 106).

Applicant respectfully submits that Duvall neither discloses nor suggests the subject matter of this claim. Specifically, Duvall neither discloses nor suggests search patterns that are usable to search for attack patterns that can be used to attack a Web server. Accordingly, for at least these reasons, this claim is allowable.

**Claims 14-17** depend from claim 13 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 13, are neither disclosed nor taught by the references of record, either singly or in combination with one another.

**Claims 18-21**

As amended, **Claim 18** recites a Web server input string screening tool embodied on a computer-readable medium comprising [emphasis added]:

- a pattern matching engine that is configured to receive an input string that is intended for use by a Web server and evaluate the input string to ascertain ***whether it likely constitutes an attack on the Web server***; and
- one or more patterns that are usable by the pattern matching engine to evaluate the input string, the patterns being defined in a manner that permits variability among the constituent parts of the one or more patterns.

The Office rejects this claim, again citing Duvall. Applicant respectfully traverses the rejection. Duvall neither discloses nor suggests a pattern matching engine that is configured to evaluate an input string to ascertain ***whether it likely***

***constitutes an attack on a Web server***. Accordingly, for at least these reasons, this claim is allowable.

**Claims 19-21** depend from claim 18 either directly or indirectly and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 18, are neither disclosed nor taught by the references of record, either singly or in combination with one another.

**Claims 22-25**

**Claim 22** recites one or more computer readable media having computer-readable instructions thereon which, when executed by a computer perform the following steps [emphasis added]:

- receiving an input string that is intended for use by a Web server;
- evaluating the input string using a search pattern to ascertain whether the input string contains an ***attack pattern*** that can be used to ***attack the Web server***, the search pattern comprising literal characters and special characters, wherein literal characters indicate exact characters in the input string, and the special characters indicate variable characters in the input string; and
- implementing a remedial action if an ***attack pattern*** is found that matches the search pattern.

In making out the rejection of this claim, the Office again cites Duvall. However, Duvall does not disclose or suggest the act of evaluating an input string using a search pattern to ascertain whether the input string contains an ***attack pattern*** that can be used to ***attack a Web server***. Because Duvall does not teach or suggest such an evaluation, it cannot possibly disclose implementing a remedial

action if an ***attack pattern*** is found that matches the search pattern. Accordingly, for at least these reasons, this claim is allowable.

**Claims 23-25** depend either directly or indirectly from claim 22 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 22, are neither disclosed nor taught by the references of record, either singly or in combination with one another.

**Claims 26-31**

As amended, **claim 26** recites a collection of Web server screening patterns embodied on a computer-readable medium comprising:

- a memory; and
- a plurality of ***attack patterns*** stored in the memory, the ***attack patterns*** being useable to screen input strings that are intended for use by a Web server, individual ***attack patterns*** being defined in a manner that permits variability among their constituent parts.

Again, the Office rejects the claim under § 102 by arguing that Duvall discloses that "the search patterns may be stored in RAM." The Office cites to column 4, lines 45-49, which was reproduced earlier.

This claim has been amended to clarify that the patterns referred to are ***attack patterns***. As discussed earlier, Duvall does not disclose attack patterns. Therefore, Duvall cannot possibly teach a plurality of ***attack patterns*** stored in memory. Accordingly, for at least these reasons, this claim is allowable.

**Claims 27-31** depend from claim 26 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited

features which, in combination with those recited in claim 26, are neither disclosed nor taught by the references of record, either singly or in combination with one another.

In addition, with respect to claim 31, which is rejected in view of Oliver, that reference is not seen to add anything of significance given the allowability of this claim.

**Conclusion**

All of the claims are in condition for allowance and Applicant respectfully requests a Notice of Allowability be issued forthwith. If the next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully Submitted,

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